

The specimen details

Diameter of bolt	d (mm)	20
Diameter of bolt hole	d_0 (mm)	22
End distance	e_1 (mm)	60
Edge distance	e_2 (mm)	50
Spacing between centres of bolts in the direction of load transfer	p_1 (mm)	60
Spacing between rows of bolts	p_2 (mm)	103
Thickness of end plate	t_p (mm)	10
Horizontal distance of lever arm	B_L (mm)	490
Vertical distance of lever arm	D_L (mm)	51.7

Steel Grade		S275	S355
Dimension of Members		UB305x165 x40	UC254x25 4x89
Depth of Section	D (mm)	303.4	260.3
Width of Section	B (mm)	165	256.3
Thickness of Web	t (mm)	6	10.3
Thickness of Flange	T (mm)	10.2	17.3
Root Radius	r (mm)	8.9	12.7
Depth between Fillets	d (mm)	265.2	200.3

Nominal Temperature

450°C

Time (minute)	Thermocouple Average(°C)	Jack Displacement (mm)	Load Angle α (°)	Beam Rotation (°)	Column Rotation (°)	Connection Rotation (°)	Force Rotation (°)	F3 from F1 (kN)	F3 from F2 (kN)	F3 Average (kN)	Tension (kN)	Shear (kN)	Moment (kN*m)
0	446.459	2.151											
1	446.425	2.150											
2	446.622	2.139											
3	447.111	2.159	55.82	0.000	0.000	0.000	58.498	-1.44	-1.11	-1.27	-0.71	-1.05	-580.92
4	447.653	3.658	55.85	0.029	0.001	0.029	58.440	0.68	1.04	0.86	0.48	0.71	392.85
5	448.071	5.259	56.10	0.017	0.016	0.001	58.208	0.87	1.07	0.97	0.54	0.81	445.06
6	448.191	6.652	56.08	0.044	0.026	0.019	58.195	1.11	1.71	1.41	0.79	1.17	647.77
7	448.157	8.041	56.06	0.093	0.029	0.064	58.164	2.94	3.51	3.23	1.80	2.68	1479.05
8	448.168	9.648	55.97	0.188	0.039	0.148	58.162	5.64	6.16	5.90	3.30	4.89	2699.37
9	448.326	11.155	55.82	0.357	0.046	0.311	58.147	4.88	5.72	5.30	2.98	4.38	2421.21
10	448.685	12.626	55.63	0.524	0.033	0.491	58.165	5.57	6.13	5.85	3.30	4.83	2668.78
11	448.961	14.177	55.48	0.693	0.024	0.669	58.152	5.56	5.90	5.73	3.25	4.72	2609.75
12	449.214	15.746	55.35	0.843	0.035	0.808	58.130	4.95	5.68	5.31	3.02	4.37	2416.25
13	449.377	17.403	55.22	0.980	0.043	0.938	58.122	5.70	6.43	6.07	3.46	4.98	2755.18
14	449.477	18.915	55.07	1.122	0.053	1.069	58.125	6.83	7.75	7.29	4.17	5.97	3304.41
15	449.592	20.455	54.95	1.256	0.066	1.190	58.116	8.01	8.70	8.36	4.80	6.84	3784.14
16	449.712	22.061	54.79	1.403	0.072	1.331	58.124	9.01	9.58	9.30	5.36	7.59	4202.01
17	449.957	23.552	54.66	1.532	0.084	1.448	58.128	9.56	10.26	9.91	5.73	8.08	4473.46
18	450.249	25.123	54.49	1.690	0.100	1.590	58.136	10.05	10.72	10.39	6.03	8.46	4680.29
19	450.351	26.727	54.34	1.846	0.115	1.731	58.138	10.41	11.12	10.77	6.28	8.75	4842.35
20	450.496	28.226	54.18	2.000	0.104	1.896	58.142	10.84	11.85	11.35	6.64	9.20	5094.40
21	450.486	29.781	54.03	2.140	0.126	2.014	58.153	11.56	12.59	12.07	7.09	9.77	5412.20
22	450.511	31.311	53.82	2.327	0.127	2.200	58.169	12.63	13.04	12.83	7.58	10.36	5739.82

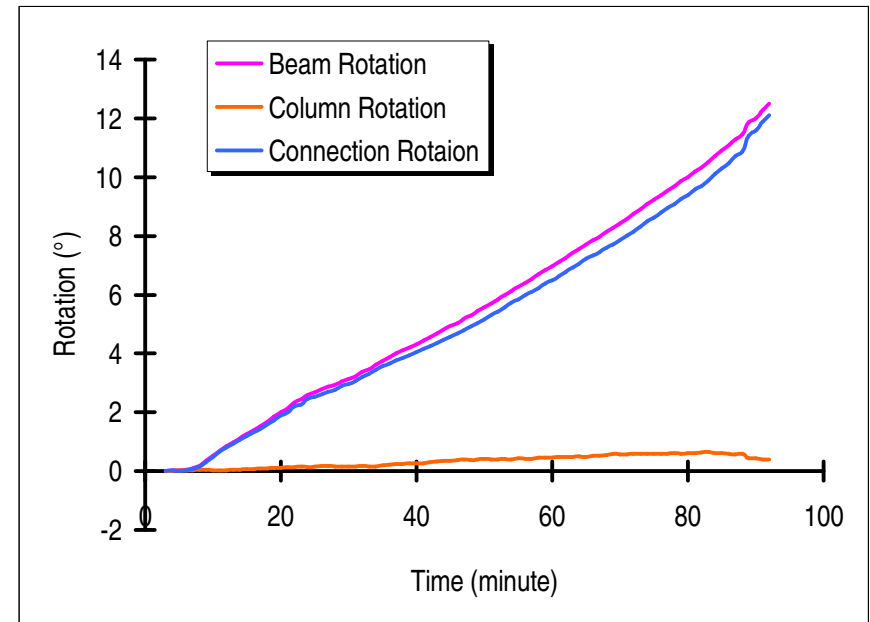
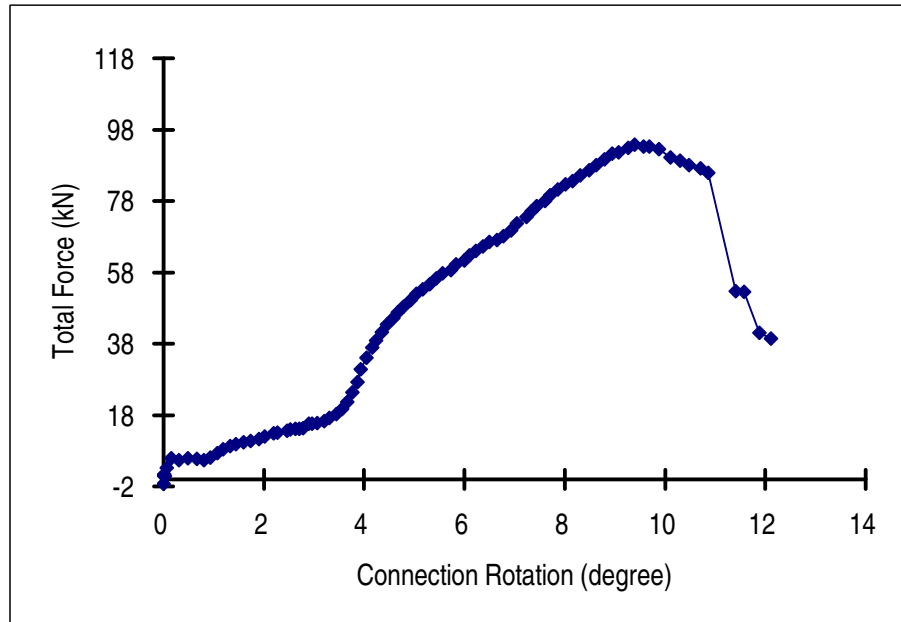
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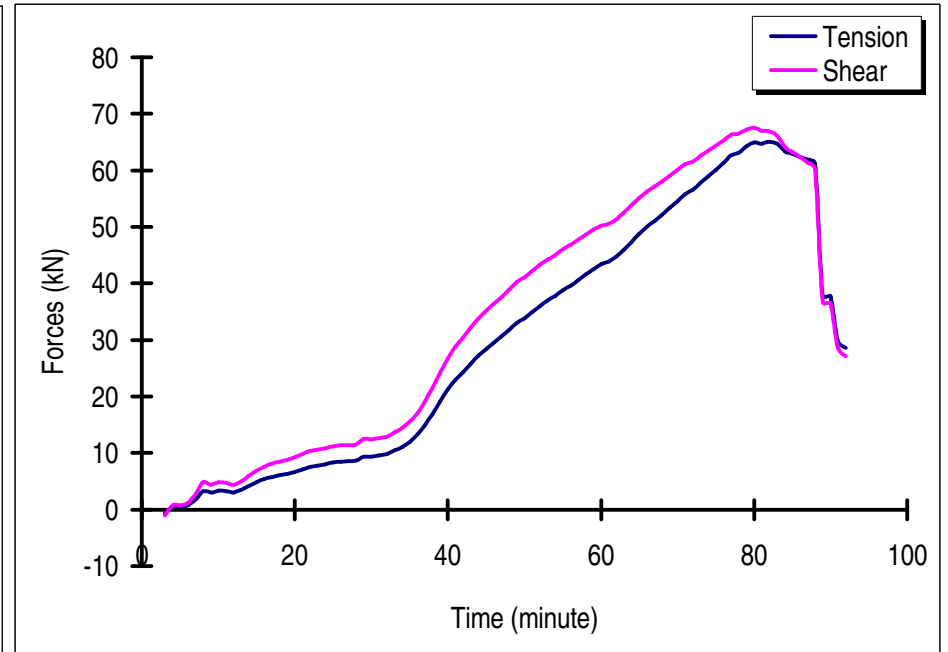
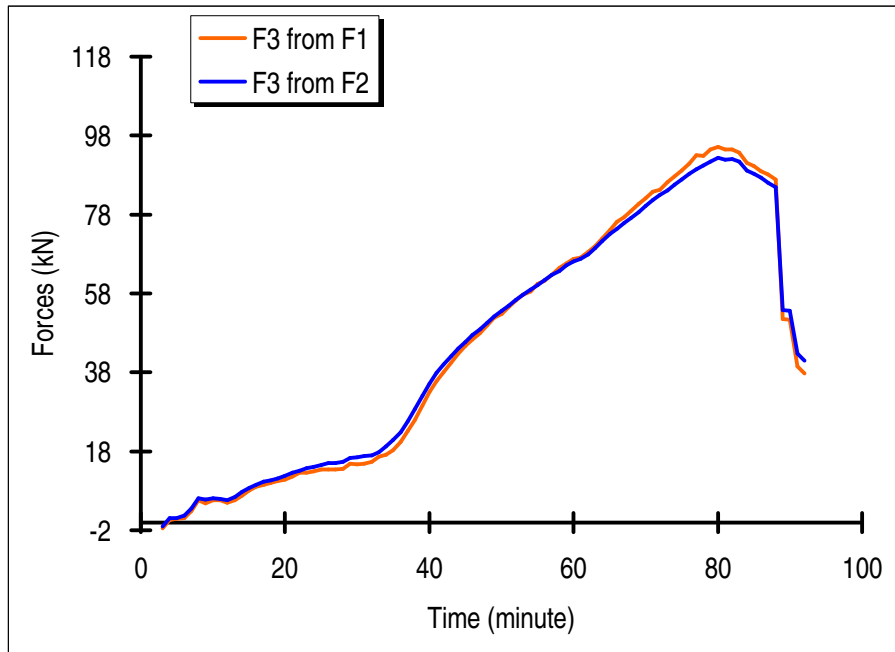
23	450.610	32.762	53.70	2.431	0.159	2.272	58.185	12.58	13.67	13.13	7.77	10.58	5862.66
24	450.697	34.254	53.53	2.602	0.140	2.462	58.186	12.93	14.13	13.53	8.04	10.88	6030.97
25	450.919	35.624	53.45	2.678	0.155	2.523	58.192	13.39	14.55	13.97	8.32	11.22	6222.08
26	451.117	36.978	53.32	2.799	0.175	2.624	58.202	13.41	14.98	14.20	8.48	11.39	6313.10
27	451.228	38.308	53.25	2.870	0.170	2.700	58.200	13.48	14.97	14.23	8.51	11.40	6321.34
28	451.291	39.622	53.17	2.940	0.163	2.777	58.207	13.55	15.27	14.41	8.64	11.54	6397.87
29	451.252	40.986	53.05	3.053	0.160	2.893	58.218	14.85	16.40	15.63	9.39	12.49	6927.56
30	451.307	42.292	52.96	3.127	0.163	2.964	58.229	14.73	16.43	15.58	9.38	12.43	6898.23
31	451.349	43.654	52.88	3.219	0.157	3.062	58.222	14.91	16.76	15.83	9.56	12.63	7005.27
32	451.456	44.945	52.72	3.368	0.168	3.200	58.234	15.40	17.05	16.22	9.83	12.91	7164.51
33	451.582	46.284	52.60	3.464	0.156	3.308	58.260	16.65	17.83	17.24	10.47	13.70	7602.35
34	451.708	47.855	52.44	3.606	0.161	3.445	58.278	17.18	19.22	18.20	11.10	14.43	8010.79
35	451.851	49.257	52.27	3.753	0.189	3.564	58.293	18.34	20.94	19.64	12.02	15.54	8627.66
36	451.803	50.764	52.10	3.885	0.218	3.667	58.331	20.38	22.83	21.60	13.27	17.05	9470.20
37	451.803	52.335	51.96	4.002	0.232	3.770	58.359	23.06	25.64	24.35	15.01	19.18	10657.35
38	451.890	53.794	51.84	4.112	0.249	3.863	58.369	25.86	28.72	27.29	16.86	21.46	11924.95
39	451.986	55.430	51.73	4.206	0.273	3.933	58.383	29.65	32.07	30.86	19.11	24.23	13467.18
40	452.030	56.985	51.59	4.322	0.273	4.049	58.406	33.05	35.17	34.11	21.19	26.73	14861.67
41	452.118	58.548	51.49	4.435	0.274	4.161	58.393	35.77	37.91	36.84	22.94	28.83	16031.49
42	452.187	60.207	51.40	4.546	0.307	4.239	58.370	38.01	39.94	38.98	24.31	30.46	16941.61
43	452.192	61.785	51.28	4.689	0.333	4.356	58.349	40.45	42.05	41.25	25.80	32.19	17903.46
44	452.227	63.316	51.18	4.807	0.347	4.460	58.332	42.77	44.06	43.42	27.22	33.83	18820.13
45	452.292	64.879	51.06	4.937	0.360	4.577	58.321	44.73	45.67	45.20	28.40	35.16	19562.65
46	452.333	66.330	50.99	5.040	0.365	4.675	58.290	46.29	47.41	46.85	29.49	36.40	20260.26
47	452.415	67.949	50.85	5.192	0.404	4.788	58.275	47.99	48.97	48.48	30.60	37.60	20928.71
48	452.475	69.368	50.75	5.297	0.374	4.923	58.273	49.85	50.61	50.23	31.78	38.90	21656.80
49	452.541	70.916	50.63	5.444	0.403	5.041	58.242	51.87	52.17	52.02	33.00	40.22	22396.23
50	452.603	72.414	50.50	5.581	0.410	5.171	58.238	52.80	53.60	53.20	33.84	41.05	22865.45
51	452.587	74.041	50.38	5.705	0.392	5.313	58.231	54.59	54.86	54.72	34.89	42.15	23484.94
52	452.681	75.588	50.27	5.834	0.400	5.434	58.218	56.18	56.40	56.29	35.98	43.29	24120.96

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53	452.741	77.294	50.12	5.982	0.414	5.568	58.215	57.62	57.75	57.68	36.98	44.27	24672.75
54	452.803	78.826	50.01	6.130	0.405	5.725	58.183	58.47	58.91	58.69	37.72	44.96	25065.74
55	452.833	80.349	49.87	6.276	0.440	5.836	58.172	60.49	60.04	60.27	38.84	46.08	25694.45
56	452.869	82.050	49.75	6.413	0.420	5.993	58.162	61.24	61.43	61.33	39.63	46.81	26106.28
57	452.850	83.627	49.63	6.523	0.427	6.096	58.168	62.75	62.69	62.72	40.63	47.78	26656.48
58	452.887	85.223	49.46	6.697	0.468	6.229	58.164	64.41	63.74	64.08	41.65	48.70	27173.86
59	452.975	86.667	49.32	6.833	0.459	6.374	58.170	65.55	65.06	65.30	42.57	49.52	27642.01
60	453.139	88.372	49.19	6.965	0.464	6.501	58.170	66.73	66.14	66.43	43.42	50.28	28071.43
61	453.204	89.926	49.07	7.125	0.475	6.650	58.127	67.11	66.83	66.97	43.88	50.59	28253.70
62	453.248	91.522	48.94	7.263	0.486	6.777	58.116	68.46	67.89	68.17	44.78	51.41	28713.52
63	453.339	93.029	48.78	7.419	0.486	6.933	58.118	70.06	69.48	69.77	45.97	52.48	29322.48
64	453.326	94.679	48.66	7.556	0.508	7.048	58.107	72.02	71.31	71.66	47.34	53.80	30068.71
65	453.361	96.298	48.49	7.714	0.482	7.232	58.117	74.03	73.01	73.52	48.73	55.05	30777.05
66	453.428	97.693	48.36	7.858	0.526	7.332	58.107	76.11	74.32	75.22	49.98	56.21	31430.06
67	453.575	99.257	48.23	7.969	0.527	7.442	58.118	77.26	75.88	76.57	51.00	57.11	31943.23
68	453.665	100.804	48.07	8.137	0.537	7.600	58.115	78.89	77.22	78.06	52.16	58.07	32488.75
69	453.736	102.222	47.91	8.285	0.580	7.705	58.130	80.66	78.64	79.65	53.39	59.10	33078.85
70	453.829	103.673	47.78	8.418	0.561	7.857	58.127	82.19	80.20	81.19	54.57	60.12	33658.48
71	453.863	105.299	47.59	8.584	0.569	8.015	58.145	83.78	81.67	82.73	55.79	61.08	34207.13
72	453.963	106.927	47.46	8.744	0.590	8.154	58.117	84.31	82.91	83.61	56.53	61.60	34508.07
73	453.986	108.369	47.29	8.906	0.594	8.312	58.129	86.18	84.17	85.18	57.78	62.58	35068.88
74	454.042	109.884	47.11	9.070	0.586	8.484	58.136	87.66	85.55	86.60	58.94	63.45	35569.86
75	454.122	111.438	46.95	9.222	0.590	8.632	58.144	89.17	86.92	88.04	60.10	64.34	36079.74
76	454.157	112.881	46.78	9.387	0.589	8.798	58.154	90.92	88.25	89.59	61.35	65.28	36620.10
77	454.203	114.516	46.61	9.529	0.586	8.943	58.180	93.01	89.50	91.25	62.69	66.31	37211.39
78	454.172	115.992	46.50	9.692	0.617	9.075	58.131	92.86	90.46	91.66	63.10	66.48	37315.55
79	454.210	117.473	46.31	9.855	0.590	9.265	58.157	94.44	91.48	92.96	64.21	67.21	37740.99
80	454.281	119.070	46.15	9.996	0.606	9.390	58.173	95.15	92.33	93.74	64.94	67.60	37969.95
81	454.306	120.615	45.97	10.183	0.611	9.572	58.171	94.46	91.90	93.18	64.77	66.99	37643.44
82	454.423	122.202	45.80	10.319	0.632	9.687	58.198	94.55	92.11	93.33	65.06	66.91	37610.64

83	454.492	123.782	45.56	10.520	0.645	9.875	58.239	93.66	91.34	92.50	64.76	66.04	37142.85
84	454.512	125.425	45.36	10.723	0.618	10.105	58.236	91.14	89.11	90.13	63.33	64.13	36082.87
85	454.522	127.179	45.14	10.899	0.602	10.297	58.277	90.23	88.26	89.24	62.95	63.26	35612.67
86	454.475	128.807	45.00	11.074	0.601	10.473	58.249	88.93	87.30	88.12	62.31	62.31	35085.16
87	454.473	130.418	44.74	11.283	0.579	10.704	58.295	88.09	86.11	87.10	61.86	61.31	34544.78
88	454.511	132.062	44.58	11.451	0.587	10.864	58.289	86.92	84.97	85.94	61.22	60.32	34002.14
89	454.647	134.163	44.20	11.863	0.447	11.416	58.254	51.56	53.79	52.67	37.76	36.73	20718.56
90	454.822	135.612	44.05	12.005	0.430	11.575	58.270	51.40	53.56	52.48	37.72	36.49	20591.37
91	454.909	137.465	43.78	12.288	0.405	11.883	58.256	39.51	42.73	41.12	29.69	28.45	16065.72
92	454.941	139.028	43.52	12.504	0.398	12.106	58.293	37.77	41.02	39.39	28.56	27.13	15330.07





Photographs after Test

